

**LOCATION OF GENERALLY RECTANGULAR  
SHAPED OBJECTS IN AN IMAGE**

The present application claims priority to US Provisional application no. 60/193,887 entitled A METHOD FOR THE AUTOMATIC CHARACTERIZATION OF RECTANGULAR BODIED SURFACE MOUNT DEVICES, filed MARCH 31, 2000.

**BACKGROUND OF THE INVENTION****1. Field of the Invention**

Aspects of the present invention relate to machine vision systems, and more particularly, to machine vision systems for locating rectangular shaped objects.

**2. Description of Background Information**

In many manufacturing processes, machine vision systems are used to automate the assembly and production process. In the semiconductor industry, for example, machine vision systems are commonly used in mounting and inspecting electronic components. In particular, electronic devices, such as semiconductor chips and resistors, are often mounted on the surface of printed circuit boards. The electronic devices, called surface mounted devices (SMDs), are mounted on the circuit board using machine vision based guidance to ensure that the device is placed at the proper position and in the proper orientation on the circuit board.

An initial step in mounting SMDs using a machine vision system involves capturing an image including the SMD and then locating the SMD in the image. Locating and finding the orientation of the SMD may be performed with a search algorithm such as the well known normalized correlation search algorithm. Before the normalized search can locate a particular SMD, however, it must be trained for the SMD. Typically, training involves inputting an abstract model to the search algorithm, thus giving the search algorithm a description of the device it is supposed to locate.